

K CHAPTER 8

TROUBLESHOOTING

This chapter describes how to find out and remedy the cause if the E5EK-DRT does not function properly.

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8.1 Initial Checks

If trouble occurs, first check items (1) to (3). Correct any problems you find according to the remedy described.

(1) Power supply

Make sure that the power supply is ON. Also, make sure that the power supply is within the rated voltage range.

(2) Wiring

Make sure that all cables are properly connected.

(3) Communication conditions

- When CompoBus/D (DeviceNet) is in use, make sure that the node addresses and baud rate conditions match, and that settings are within the specified ranges.

Make sure that communication data assignment, communication data format, operation at communication error, and remote/local selection are correctly set.

If, as a result of checking or processing, the trouble is not remedied, check the details, for example, on the error display.

MS/NS Indicator

When communications is being performed successfully, both the MS and NS indicators light green.

The E5EK-DRT is equipped with a function for monitoring the communications power supply.

For this reason, the MS lights green and NS blinks red when the E5EK-DRT power is being supplied with the communications power not being supplied.

MS (Module Status) Indicates the status of the node itself.

NS (Network Status) Indicates the status of the network.

LED Lighting Specifications

LED Status	Meaning (main error)
MS: Lights green NS: Lights green	In this state, the communications network and control are normal.
MS: Lights green NS: Blinks green	In this state, the communications connection with the master is not established.
MS: Lights green NS: Blinks red	A time-out has occurred in communications with the master, or the communications power supply may not be supplied.
MS: Lights green NS: Lights red	A duplicated node address error has occurred, or BusOff (communications stopped by frequently occurring data errors) has been detected.
MS: Lights red NS: Out	Unrecoverable fatal error has occurred. If this trouble persists even after the E5EK-DRT has been turned OFF and then ON again, repair is necessary.
MS: Blinks red NS: Current status	A CompoBus/D (DeviceNet) communications data assignment error has occurred. When a communications data assignment error occurs, change the settings using the keys on the front panel or a configurator. The NS indicator indicates the current status, and is controlled normally.

MS: Out	Power is not being supplied to the controller, or the controller is reset.
NS: Out	The controller is not on-line.

8.2 How to Use the Error Display

When an error has occurred, the No.1 display alternately indicates error codes together with the current display item.
This section describes how to check error codes on the display, and the actions you must be taken to remedy the problem.

5.E r r

Input error

Meaning	Input is in error.
Action	Check the wiring of inputs, disconnections, and shorts, and check the input type.
Operation at error	For control output functions, output the manipulated variable matched to the setting of the “MV at PV error” parameter (level 2 mode). Alarm output functions are activated when the upper limit is exceeded.

E 1 1 1

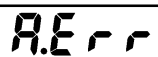
Memory error

Meaning	Internal memory operation is in error.
Action	First, turn the power OFF then back ON again. If the display remains the same, the E5EK-DRT controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.
Operation at error	Control output functions turn OFF (2mA max. at 4 to 20mA output, and output equivalent to 0% in case of other outputs). Alarm output functions turn OFF.

E 3 3 3

A/D converter error

Meaning	Internal circuits are in error.
Action	First, turn the power OFF then back ON again. If the display remains the same, the E5EK-DRT controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.
Operation at error	Control output functions turn OFF (2mA max. at 4 to 20mA output, and output equivalent to 0% in case of other outputs). Alarm output functions turn OFF.



Calibration data error

This error is output only during temperature input, and is displayed for two seconds when the power is turned ON.

Meaning

Calibration data is in error.

Action

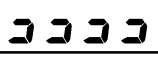
Must repair.

Operation at error

Both control output functions and alarm output functions operate. However, note that readout accuracy is not assured.



Display range over



Meaning

Though not an error, this is displayed when the process value exceeds the display range when the control range (setting range $\pm 10\%$) is larger than the display range (-1999 to 9999).

- When less than “-1999” [C C C C]
- When greater than “9999” [D D D D]

Operation

Control continues, allowing normal operation.



Communications error

Meaning

The communications read/write data assignment is in error.
This error occurs in the following instances:

- When the same data is set to two or more channels
- When write-only data is set to a read data assignment
- When read-only data is set to a write data assignment

Action

Check and reset the communications read/write data assignment data in the option mode. For details, see “6.4 Data Assignments.”

Operation at error

Control output functions turn OFF (2mA max. at 4 to 20mA output, and output equivalent to 0% in case of other outputs).
Alarm output functions turn OFF.

8.3 How to Use Error Output

The E5EK-DRT controller allows you to assign error output to terminals as outputs.

For details on output assignments, see 3.3 Setting Output Specifications (page 3-7).

LBA

- LBA (Loop Break Alarm) can be used as a means for detecting loop breaks when the control loop is not functioning normally. For details, see page 4-11.
- LBA allows you to detect the following errors:
 - (1) Heater burnout
 - (2) Output error (contact weld, damaged transistors, etc.)
 - (3) Sensor error (constant input values, etc.)
- If you use the LBA function, set the loop break detection time matched to the control characteristics in the “LBA detection time” parameter (level 2 mode).

Input errors

- If you assign error 1 as the output, an error can be output to auxiliary output 1 or auxiliary output 2 when input is in error. When this error occurs, remedy by following the description for “Input error” (page 8-3).

A/D converter error

- If you assign error 2 as the output, an error can be output to auxiliary output 1 or auxiliary output 2 when the A/D converter is in error. When this error occurs, remedy by following the description for “A/D converter error” (page 8-3).

Remote SP input error

- If you assign error 3 as the output, an error can be output to auxiliary output 1 or auxiliary output 2 when the remote SP input error occurs while the remote SP function is enabled. For details on error displays and meanings, see Chapter 4 Applied Operation/4.3 How to Use the Remote SP (page 4-7).
- When an error occurs, check the state of the remote SP connection. If the lead is broken or disconnected, the remote SP scaling lower limit is displayed blinking on the PV/SP display or remote SP monitor display.

8.4 Checking Operation Restrictions

With the E5EK-DRT controller, auto-tuning sometimes does not operate depending on the way functions are combined. The table below summarizes the main operating restrictions.

If the E5EK-DRT controller is not operating properly, first check whether operating conditions violate the restrictions in this table.

Restriction	Inoperable or Invalid Functions		
	AT Execution	Limiter Function	Other
At heating and cooling control	40% AT impossible		
At ON/OFF control	Execution impossible	Manipulated variable MV change rate	
At AT execution		MV change rate	Parameter setting
At stop	Execution impossible	Manipulated variable MV change rate	